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From the Author.

SOME OBSERVATIONS

ON THE VARYING FORMS

OF THE

HUMAN CRANIUM,

CONSIDERED IN RELATION TO

THE OUTWARD CIRCUMSTANCES, SOCIAL STATE,

AND INTELLECTUAL CONDITION OF MAN.

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SOME OBSERVATIONS ON THE VARYING FORMS
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It has been well observed, by an able writer, that “we have histories of the Church, histories of Philosophy, histories of Ancient Empires, and histories of Modern ones; but a history of Man, as a rational and moral being, is wanting;” and he has not unsuccessfully attempted, so far as the confined limits of a “*Small Book on a Great Subject*” would permit, to supply the desideratum, in his Essay, “*On the State of Man before the Promulgation of Christianity*.”* The labours of our great Ethnologist and former President, the late Dr. Prichard, in his elaborate “*Researches into the Physical History of Mankind*,” has thrown a flood of light upon the subject; for not only has Dr. Prichard placed Ethnology on a scientific basis, but of him it has truly been said, in relation to all the collateral departments of inquiry, that “he has acquitted himself *in each*—whether Physical Geography, Anatomy, Physiology, Psychology, History, or Philology—as if each one of them alone had occupied his attention.”† As bearing on the same object, it has appeared to me, while viewing man in his threefold capacity of an animal, moral, and intellectual being, and the brain, or encephalon, as the material organ of the mind,—where the *ultimate, molecular changes* precede mental states, and where the *mandates of the will* originate those which terminate in *acts of volition*,—that an inquiry of great ethnolo-

* Published by Pickering, London, 1848.

† Vide Edinburgh Review, Vol. lxxxviii. page 487.

gical interest is suggested, from the consideration of the *relations* which co-incidentally exist between the varying forms of the bony envelope of the encephalon, the skull, and the outward circumstances, social state, and intellectual condition of man.

The admirable and valuable paper *on the Human Mouth*, by the late Mr. Nasmyth, read before this Society in 1845, and published in the first volume of its Transactions, has an important bearing upon such an inquiry; and I would here take the opportunity, in reference to it, and to his other physiological and microscopical investigations, of paying a passing tribute of respect to the memory of our departed friend.

We listened to his Paper with interest and pleasure, and we may all peruse it again with profit and advantage. It partakes more of a physiological character than any other paper that has since been read before us; and as we cannot fairly be accused of giving undue prominency in our discussions to physiological considerations, I have felt emboldened to follow his example, and to solicit your attention on the present occasion to some observations, which, perhaps, many who are here present may be inclined to consider as belonging more strictly to physiological psychology than to Ethnology. But be that as it may, it will be readily conceded the subject is of so comprehensive a character, that it is impossible within the limits of an ordinary Paper fully to consider it in all its bearings, and that our minds, whatever may be the subject of discussion, naturally fall into those habits of thought and inquiry to which they are most accustomed.

From the structure of the human mouth, Mr. Nasmyth adduces the *unity* of the species, maintaining, that the original configuration of the jaws was of the vertical or Caucasian type; and, in consequence, that the varieties of development in the mouth are deviations from a perfect form. To my mind, the evidence is irresistible, which is furnished by anatomy, physiology, and psychology, for the *unity of the human species*—that the *genus HOMO is one*; but whether there may have been more creations *than one of the same species*, is another question foreign to our present inquiry, and requiring for its solution other and a different kind of evidence.

Mr. Nasmyth justly observes, “that the natural action of the lower jaw upon the upper may push out, avert, or expand the arch of the upper jaw; but, on the other hand, that it is impossible by any habitual or natural act performed by the mouth, or by the individual, in any way to bring in, or to contract that arch, so as to produce out of the prominent jaw of the negro the vertical or perpendicular jaw of the Caucasian. The prominent character may, indeed, be derived from the vertical, but the vertical can never be produced out of the prominent by habit or exercise.”

Compared with that of the lower animals, the *human mouth* presents a medium type, befitting the omniverous character of man, and adapted to the higher and nobler offices of articulate speech. In the Caucasian races, and in their normal development, there is a regular symmetrical arrangement of the teeth—the *best adapted for perfect articulation and mastication*; the entire range forming a perfect parabola, each tooth standing nearly perpendicularly to that portion of the alveolar ridge to which it is attached. But where excessive functional activity is thrown upon the concentric arches of the anterior portions of the jaws, as in the usages of savage life, in seizing, tearing, and dividing the food by the teeth, the front ones become everted, and the jaws prolonged, and thus the *prognathous* type is perpetuated.

The upper jaw yields more readily than the under, from the greater plasticity of the inter-maxillary bones; and these bones becoming everted and tilted in their turn, give rise to the *flattened nose*, as the concomitant of the elongated jaws, so well exemplified in the negro of the Gold Coast, and in the Australian savage.

Where, again, extraordinary energy is directed to the *lateral* and *posterior* portions of the jaws, as in the *grinding exactions* of uncivilized life, *great prominency* is produced in that part of the *superior maxillary* bones into which the *molar teeth* are implanted. And the fangs of these teeth being developed both powerful and divergent, the balls of the cheeks—the molar and super-maxillary bones—are greatly expanded and enlarged, and, through them, the zugomatic arches; thus giving

rise to the lozenge-shaped face and pyramidal head of the Esquimaux.

The most eminent Ethnologists agree with Dr. Prichard that there are *three typical forms* of the human cranium, from which all the existing varieties may be traced—the *prognathous*, or Ethiopian; the *pyramidal*, or Mongolian; and the *oval*, or Caucasian, prevailing respectively and concomitantly in the savage, nomadic, and civilized races of man. “Among the rudest tribes of men,” to use the language of Dr. Prichard, “hunters, and the savage inhabitants of forests, dependent for their supply of food on the accidental produce of the soil or on the chase, among whom are the most degraded of the African nations and the Australian savages, a form of the head is prevalent, which is most aptly distinguished by the term *prognathous*, indicating a prolongation or extension forward of the jaws. A second shape of the head, of a very different character, belongs principally to the *nomadic races*, who wander with their herds and flocks over vast plains, and to the tribes who creep along the shores of the Icy Sea, and live partly by fishing, and in part on the flesh of the reindeer. These nations have broad and lozenge-formed faces, and what I have termed pyramidal skulls. The Esquimaux, Laplanders, Samoiedes, and Kamtschatkans, belong to this department, as well as the Tartar nations, meaning the Mongolians, Tungusians, and the nomadic races of Turks.

“The most civilized races, those who live by agriculture and the arts of civilized life, all the most *intellectually* improved nations of Europe and Asia, have a shape of the head which differs from both the other forms. The characteristic form of the skull among these nations may be termed *oval* or *elliptical*.”

Now the venerable Blumenbach has invested the maxillæ with undue importance in making them the salient points upon which the general character of the head depends. We have seen, from the structure of the human mouth, that the prolongation of the jaws, and the expansion of the cheek bones and the zugomatic arches, are due to the usages of the teeth and the action of the mouth, in the seizing, tearing,

and grinding of the food; in a word, to the exercise of a purely animal function, with which the encephalon has little or no concern.

We are told that the jaws of the negro infant are upright, and there can exist no reasonable doubt that the *lengthened* period of suckling—from two to three years—which prevails amongst them, must give a direct tendency to their eversion. But if that period were limited to a few months, and the exertions of savage life abandoned, we can readily conceive how the elongation of the jaws would cease to be perpetuated, from the mere adoption of the usages of civilized society in reference to food alone.

The distinction, however, between the protuberant and the upright jaw is certainly characteristic and important; and Professor Retzius of Stockholm, after dividing the great family of man into *Dolichocephalæ* and *Brachycephalæ*—into *long-heads* and *short-heads* in proportion to their breadth—has again subdivided each of these two great classes according to the *uprightness* or *prominence* of the jaws, into *orthognathæ* and *prognathæ*. Thus, in the class *Dolichocephalæ*, he has the orders—

1. *Orthognathæ*—comprising the Gauls, Celts, Britons, Scots, Germans. Scandinavians.
2. *Prognathæ*—the Greenlanders, and various North and South-American Indian races, such as the Caribs, Botocudi, &c., Negroes, New Hollanders.

And, again, in the class *Brachycephalæ*, the orders—

1. *Orthognathæ*—comprehending the Slavonians, Finns, and the other Tschudisch races, Affghans, Persians, Turks, Lapps, &c.
2. *Prognathæ*—the Tartars, Kalmucks, Mongols, various North and South-American races, such as the Incas, Carruas, Papoes, &c.

This division of mankind, by Retzius, into *Dolichocephalæ* and *Brachycephalæ*, has an important psychological bearing, inasmuch as it indicates the comparative development of the posterior lobes of the brain, and the extent to which they overlap the cerebellum. On this fact rests the value and impor-

tance of Professor Owen's method of viewing the base of the skull, in reference to the foramen magnum; and it is worthy of remark, that the chief distinction between man and those mammalia whose cerebral organization approach the nearest to his, is, that the posterior lobes of the latter are so little developed, that the cerebellum is left nearly or quite uncovered by them. Mr. Solly has well observed, "It is a curious coincidence, to say the least of it, that as the *longest* heads in the human species contain the most active and intelligent brains, so do we find the greatest advance from the lower forms of brain to the higher, made by *lengthening* the brain, as shewn by the transverse foldings. It is an old adage, and it is a true one, in speaking of a clever man, to say, '*he is a long-headed fellow.*'" *

But it must be acknowledged that no one has studied the varying forms of the human crania, with a view to their psychical significance, with so much care and attention, and on so extended a scale, as the illustrious Gall: it was the labour of his life, and he was the founder of cranial and physiological phrenology. One of the most remarkable men of the age in which he lived, he was alike distinguished for originality and independence of thought, for his powers of observation, untiring industry, and indomitable perseverance. To him, and his able coadjutor, Dr. Spurzheim, cerebral anatomy,† physiology, and psychology, are under great obligations. Since their time, indeed, and both in this country and abroad, great advances have been made towards a more exact knowledge of the functions and special endowments of the nervous centres, so that the progress of physiological discovery may lead us to reject or to modify many of their generalizations and views. But all honour is due to Gall, for he was the first to enunciate clearly the true relations between the psychological nature of man and that of the lower ani-

* Solly on the Brain.

† I had the good fortune to witness Dr. Spurzheim's demonstrations of the brain at St. Thomas's Hospital during the period of my pupilage, and this circumstance gave a bias in my mind towards physiological psychology.

mals; and it is no detraction from his merit to re-consider the system of organology which he propounded by the light which subsequent physiological inquiry and discovery have thrown upon the subject.

Among living physiologists, Dr. Carpenter has done more than any other man to specialize the functions of the nervous centres of the encephalon, and through comparative anatomy, by analytical reasoning and strict induction, to advance our knowledge of the physiological psychology of man.

To my mind he has fully established the following important positions:—

1. The independent character of the sensory ganglia, as instruments of sensation, and of respondent consensual and instinctive actions.
2. The super-added character of the cerebrum, or great hemispherical ganglia, as the *phrenic ganglia* of the brain, the seat of our intellectual operations and reasoning processes, where ideas are formed, and where the WILL exerts its power.
3. The composite or mixed nature of the propensities, emotions, and moral feelings, as compounded of ideas and the sensorial feelings of pleasure and pain; the former, their intellectual element, having their seat in the hemispherical ganglia, and the latter, or sensational, in the sensorium commune, or sensory ganglia.

It is now, indeed, admitted that there is no point in physiology more clearly made out, than that the cerebrum, or great hemispherical ganglia, are the *phrenic ganglia* of the brain—the seat of perception and of thought—“the sole receptacle,” in the language of Cuvier, “where sensations are *perceived* and *consummated*,”—idealized, and become the pabula of thought. They are the centre of intellectual action and volitional power, the seat of the understanding and the will. But it is equally established, that the development of the cerebrum moulds and fashions, giving shape and configuration, with some well understood limitations, to its bony covering, the skull, so that certain *outward* and *visible signs* become indices of the intellectual power and energy *within*. To be satisfied of this, we have only to contrast the low, narrow, and receding

forehead of the poor idiot, or degraded negro, with that of others, and to compare, as Gall has done, the heads of differently gifted men and distinguished individuals. Throughout the whole of the vertebrate sub-kingdom the type of the brain is the same; but in man, the cerebrum, or hemispherical ganglia, are so enormously developed, that they completely enclose, overlap, and crown the other encephalic centres, giving configuration and volume to the bony envelope; whilst in the lowest of the series the representatives of these hemispheres are limited to the anterior lobes, and reduced to mere laminae or crusts. But they gradually increase in size, complexity of structure, and in the number of their lobes and convolutions, as the animal rises in the scale of intelligence, until they reach their culminating predominancy in man.

Professor Retzius has elaborately investigated the development of the cerebrum in the ascending vertebrata, and its different phases in the human embryo. His observations completely confirm the statements of Tiedemann and Serres, as to the order in which the different lobes are evolved; shewing that the *anterior lobe only* exists in fishes; that this enlarges as we ascend through the classes of reptiles and birds, but does not change its character; that the middle lobe is not developed until we reach the mammalian class, presenting itself first in a very rudimentary form, and attaining increased development as we ascend; that the posterior lobe is developed from the back of the middle lobe, making its first appearance in the carnivorous group. To this history the embryonic development of the human cerebrum presents an exact parallel; the anterior lobe making considerable progress before the middle begins to be evolved, and the posterior being the latest in the order of succession.

This tripartite division of the cerebrum into distinct lobes, and the order and succession of their development, are points of great psychological significance; for the observed facts clearly indicate that the cerebral lobes are evolved from *before backwards*, in the order and degree of their importance as psychical instruments, and they point to the middle and posterior lobes, but especially to the latter, of these, with peculiar interest. It is only in man that we meet with such

a great development *backwards* of the posterior lobes, and that the cerebellum is completely overlapped and covered by them. The anterior lobes are remarkable for their great extension *forwards*; but it must be conceded that the chief distinction between the cerebrum of man and that of the higher mammalia is much more striking in reference to the *posterior* than to the *anterior* lobes. "The brain of the chimpanze," says Professor Owen, "in the relative proportions of the different parts, and the disposition of the convolutions, especially those of the posterior lobes, approaches nearest to the human brain: it differs chiefly in the *flatness* of the hemispheres, in the *comparative shortness of the posterior*, and in the *narrowness* of the anterior lobes."

I am fully aware that some physiologists maintain that this tripartite division of the cerebrum into lobes is altogether arbitrary and useless; and I am free to confess that it is quite impossible, when we survey the cerebrum from above, to point out where the second lobe ends and the third begins; for there is no breach in the continuity of the surface, but between the first and second the *fissura Sylvii* presents a line of demarcation sufficiently distinctive, and on turning the base of the brain upward we at once see the meaning of these divisions.

No one, however, can make any such survey of the brain without being struck with the appearance and character of its convolutions.

A classification of these, begun by Professor Owen, has been greatly extended by M. Leuret, and it is much to be regretted that he did not live to complete his elaborate and valuable researches. The subject is one of great interest and vast importance, for it is an indisputable fact, that the complexity of these convolutions is an index to the place which the animal holds in the scale of intelligence. "Observation," says Leuret, "has shewn what strict induction had led us to conclude, that each group of brains among animals has a type proper to it, and that the type is characteristically manifested by the form of its convolutions." Every family has a brain formed in a determinate manner, and the number, form, arrangement, and relations of the convolutions are found to be in strict accordance with the intelligence dis-

played. He justly makes a distinction between those convolutions which are *primary* and *fundamental*, and to be found throughout the whole series of convoluted brains, occupying the same position, and differing only in their size and extent, and those secondary convolutions which are not constant, even in brains of the same group of animals, but are dependent upon the extent of the *primary* ones, and the connections which they form with others that are near them.*

* Gall was the *first* who *classified* the *convolutions*, and the labours of Gall, Spurzheim, and Holm in this interesting field of inquiry were great and manifold; and I would here take the opportunity of paying a passing tribute of respect to the memory of Mr. H. H. Holm, the friend and pupil of Spurzheim, who studied comparative cerebral anatomy with great enthusiasm. He was a fellow of the Zoological Society, and, residing near the Society's menageries, he had easy access to the collection, of which he availed himself, to study the habits and dispositions of the animals; and having permission to examine the crania and brains of those which died, his anatomical and physiological researches were rightly carried on.

Professor Owen, in his valuable paper on the Anatomy of the Chetah," (*Felis Jubata*,) communicated to the Zoological Society on Sept. 10, 1833, and published in the first volume of the Society's Transactions, gives a note from Mr. Holm, containing his opinions of the *functions* of the different convolutions in the brain of the chetah, on a comparison of it with the human brain and that of some other animals. After an elaborate description of the brain of the chetah, Professor Owen says—"Of the constancy of the disposition of the convolutions represented by Gall and Spurzheim as characteristic of the brain of the feline genus, I was *first* assured by our fellow-member, H. H. Holm, Esq., Lecturer on Phrenology, whose attention has long been directed to this part of anatomy." Mr. Holm was a Member of the Royal College of Surgeons, but, enjoying an independency, he devoted himself to the pursuit of phrenology, instead of entering upon medical practice. His lectures were amply illustrated by casts, crania, and brains. He pointed out the cerebral convolutions which constitute the several organs, described the modifications which the convolutions receive, and compared them together to illustrate their magnitudes, positions, junctions, and outer connections with great ability; and so highly did Dr. Spurzheim estimate his talents, knowledge, and zeal, that he made him the special depository of his latest views on the configuration of the cerebral organs in man and the mammalia. Unfortunately, like Leuret, he was cut off in the midst of his labours, and in the fortieth year of his age.*

* *Vide* a Biographical Notice of Mr. Holm in Vol. XIX. Phrenological Journal.

To determine the functions of the primitive convolutions is *the great problem of physiological psychology*. We are required carefully to note the first appearance and progressive development of the primitive and fundamental convolutions from *below upwards*, in the ascending series of animals, and to endeavour to analyze the characters of the different animals, in relation to the objects of their intellectual faculties, in accordance *with their cerebral convolutions as contrasted with mere consensual actions*. Like things are to be compared with like, convolution with convolution, and the same groups in different animals with each other.

Now, proceeding in this way, I think it may fairly be inferred, both from human embryology and comparative anatomy, that the *primitive* and *basement* convolutions of the cerebral hemispheres are the *great internal convolutions*—the *ourlet* of Foville. The thin laminæ or crusts which cover the corpora striata in the brain of the fish are manifestly the homologues of these convolutions: and since it is in the fish that we have the first clear and distinct evidence of the exercise of perception, memory, and volitional power, as opposed to *mere consensual actions*, may we not legitimately conclude, that these great internal convolutions *are the portals to intellectual action, where sensible impressions become perceived and remembered, and where the will exerts its power*; in other words, that they are the organs of *perception* of *outward existences*, and its associates *memory* and *volition*? Of all the convolutions of the brain, these great internal convolutions are the most symmetrical: their connections are multitudinous, and commensurate with their importance. They are the most constant and regular of all the convolutions, and each exhibits with its fellow on the opposite side the most exact symmetry.*

* "Of the internal convolution, or that of the corpus callosum, called by Foville, *convolution d'ourlet* (*processo cristato*—Rolando) the principal portion is above and parallel to the corpus callosum: in front it curves down parallel to the anterior reflector of the corpus callosum, as far as the locus perforatus, connecting it with some of the *anterior convolutions*. Behind, it passes in a similar manner round the posterior reflection, connecting itself with some of the *posterior convolutions*, and

First, and anteriorly, they are in intimate connection with those super-orbital convolutions of the anterior lobes, to which pathological investigations point as the organs through which we acquire a knowledge of the physical adjuncts of external existences, such as their size, shape, colour, number, weight or resistance, &c.

Secondly, and laterally, they are connected with those primitive and early-developed basilar convolutions surrounding the fissura Sylvii, and which appear to administer to the universal instinct of *self-conservation*.

Thirdly, and posteriorly, they are in intimate union with those backwardly developed convolutions of the posterior lobes which belong more exclusively to the family of man.

Fourthly, and superiorly, they are connected, through an order of anastomosing convolutions, with those great marginal convolutions which constitute the outer and most exalted boundaries of the hemispheres, and with those which take a longitudinal but tortuous course on the open and outer surface of the brain, thus *connecting perception, the FIRST step above sensation, with the loftier regions of thought*.

Now, the animal appetites of *hunger* and *thirst*, as subjective sensations, have their immediate seat in the *vesicular nervous tissue* of the stomach and mouth. They are instinctive and internal cravings or feelings, implanted by the Author of Nature, in accordance with the "lex nostri con-

in the *middle lobe* forming the hippocampus major, the anterior extremity of which is situate immediately behind the fissura Sylvii and locus perforatus. Its horizontal portion appears to be connected with some nearly *vertical* ones, which seem indeed to branch off from it. It forms, to use Foville's expression, a *hem* or *selvage* to the cortical layer of the cerebral hemispheres. The free margin of this convolution varies its character in different brains, according to the degree of tortuosity it exhibits, and the number of small fissures which are met with in it. The small folds which connect it with other convolutions on the inner surface of the hemisphere vary in number, and are generally found most numerous in the posterior part. Some of these folds are not distinctly visible unless the sulcus above it has been freely opened, as they are situated quite on its floor."—(Dr. Todd, on the Physiology of the Nervous System, "Cyclopædia of Anatomy and Physiology," p. 697.)

servatio," to use the language of Prochaska; for *the instinct of self-preservation* is the most universal instinct in nature, and the very first that is called into action. To it all the special senses are subservient, but first and foremost those of smell and taste. It is the sense of smell which attracts and guides the human infant to the mammary gland of its mother, to satisfy *an internal want or craving*.

But the *desire* for food, the conceiving of the modes, and the adoption of the measures to secure it, necessarily implies the agency of psychical faculties for the gratification of the *propensity* for food; and, if we follow up the cerebral connections of the olfactory peduncles, the special ganglia of the sense of smell, we find that they are not only, in connection with the thalami optici, the *great centres of sensorial feeling*—the foci and point of union of all the nerves of special sensation; but also that they are directly connected with the primitive basilar convolutions which surround the fissura Sylvii, and which are coeval, in point of existence, with the fissura itself.

But it would here be out of place farther to pursue the inquiry into the functions of primitive and fundamental convolutions; and I have to express my regret—indeed we must all regret—that Leuret and Holm should have died in the midst of their labours.

The comparative development of the cerebrum in the typical races of man remains to be investigated; and we have here a field of inquiry fraught with interest, and pregnant with consequences of the highest importance. For, beyond the generally observed facts of a greater posterior development of the cerebrum, and of the presence of some additional convolutions on the superior and anterior parts of the hemispheres, among the intellectual and more cultivated races, nothing that I am aware of has been effected in this interesting field of inquiry. But the institution of a comparison between the brains of different individuals, known to be distinguished for their intellectual powers or special endowments, would lead to the most important results. The value of pathological investigation is not to be underrated, for, if I am not greatly mistaken, it is to post-mortem examinations of the brain, and to pathological investigation, more than to

any other source, that we are to look, not for the discovery of *normal* functions, but for evidence in support or refutation of opinions advanced.

It is a matter of common observation, that the fully-developed cerebra of different individuals present innumerable diversities in *form* and size; so many indeed, and as different as are the diversity and varying phases of the human character amongst us: so that it has reasonably been doubted whether ever two individuals were, in all respects, exactly alike.

To all who are interested in the progress of psychological science, and who have the means of pathological investigation, I would recommend the writings of Gall, and, at the same time, urge upon them the duty of allowing no opportunity to escape them of bringing his dogmata to the test of experience. So far as *outward* and *visible* signs are concerned, he has, from multiplied observations, established certain cranial *landmarks*, which are highly important in the study of the typical races of man. Cranioscopic observations have led to the general belief, so far as this kind of evidence can produce conviction, that the anterior portions of the cerebrum are subservient to perceptive and intellectual operations—that the coronal and ascending regions are associated with our higher sentiments and thoughts; and that the lateral basilar and lower posterior administer to the animal propensities and lower affections of man.*

* A curious and interesting communication, "On the size of the Head, national and provincial, observed by an experienced hatmaker of London," was made to the London Phrenological Society, and published in Vol. IV. of the "Phrenological Journal."* From it we learn that the hatter's method of computing the general size of the head is to take the medium of its length and breadth. "For instance, a hat eight inches long by seven broad makes seven and a half inches diameter for the hatter's measure; seven inches by six gives six and a half inches medium or diameter; and on this principle blocks are used in the manufacturing and measuring of hats to particular sizes, varying from five inches, the size of an infant, to seven and three quarter inches, the general full size of man." The writer remarks—"By this mode of measurement the range of the male head, in England, at maturity, is from

* *Vide* Vol. IV., No. 16, p. 259, "Phrenological Journal."

Before reverting to the typical forms of the skull, and briefly adverting to the existence of historical evidence in

six and a half to seven five-eighths inches, the medium and general size being seven inches :—

“ENGLAND.—Commencing with London,” he says, “a perceptible difference will be observed between the higher and lower classes of society. In the former the majority are above the medium, while amongst the latter it is very rare to find a large head. Taking the two extremes of society, the same rule will be found invariable throughout the country—the middle ranks of life forming a medium between the two.

“Leaving London, to the north and north-east, in the counties of Hertford, Essex, Suffolk, and Norfolk, a greater amount of *small heads* will be found than in any other part of the kingdom. Essex and Hertfordshire are the most remarkable for requiring small-sized hats : seven inches, the medium size given, is here, as in Spitalfields, or among the weavers of Coventry, a full size ; six five-eighths to six and a-half are prevailing sizes ; and six five-eighths, the usual size for a boy of the age of six years, is here often to be met with in the full maturity of manhood.

“Crossing over the Thames to Kent, Surrey, and Sussex, we observe an immediate increase in size of the usual average, and the inland counties in general, I believe, are upon nearly the same scale. Towards Devonshire and Cornwall the heads are quite of the *full* sizes : many very large hats are required for both counties. The Welsh heads are above the usual average ; and in Hereford, on the borders of Wales, they are superior to the London average.

“Travelling towards the North, a gradual increase of size will be observed, the counties of Lancashire, Yorkshire, Cumberland, and Northumberland, having *more large heads* in proportion than any other part of the country. The *largest sizes* I could ever trace have had their origin in the northern part of England or Scotland, the neighbouring portion of the kingdom ; and, on the contrary, I have traced repeatedly the *small* head to the districts alluded to as exhibiting that peculiarity, Essex, &c.

“SCOTLAND.—Entering Scotland, the *full-sized* head is known to be possessed by its inhabitants. Large heads are no doubt to be met with in Essex, and small heads in Scotland ; but they must be viewed as exceptions rather than as the provincial or national sizes. The contrast in the trade of Essex and Hertfordshire with that of Scotland, in point of size of hats, is very manifest ; seven inches, the general medium, being a *large* size in the former counties, is considered in the *North* as approaching to a small size.

illustration of the fact of the conversion of one type into that of another, I have to apologise for the length to which I have carried these observations. Interesting they may be to some who are present; but I cannot conceal from my own mind the apprehension that they do not possess that general interest which has so uniformly characterized the Papers which have been read before us. And indeed, but for the fact that we have for our President so eminent a physiologist as Sir Benjamin C. Brodie, I might, nay, I would, have hesitated before I had entered upon the course I have pursued.*

The protuberant jaw is associated with the narrow and receding forehead—the head may be comparatively long, but it is remarkably narrow in proportion to its length, as in the Negro, Carib, or New Hollander, suggesting the idea of lateral pressure; or it may be short, as in the Tartars, Kal-mucks, Incas, Papoes, &c. In the pyramidal type, with the flat and broad face, there is a like narrowness of the forehead, and deficiency of anterior development. The most striking peculiarity in the skull is the *shortness* of the long or antero-posterior diameter in relation to the lateral, being, in the case of the Lapps, only as 1·20 to 1·00.

Dr. Prichard justly remarks—"The greater relative development of the jaws and zygomatic bones, and of the bones of the face altogether, in comparison with the size of the brain, indicates, in the *pyramidal* and *prognathous* skulls, a more ample extension of the organs subservient to sensation and the animal faculties, and such a configuration is adapted, by its results, to the condition of human tribes in the nomadic state, and in that of savage hunters."

"Respecting the Irish head,—so far as I have experience but my opinion is formed on grounds too partial for a general conclusion,—I should say that the Irish generally possess larger heads than the English. The higher classes from Ireland, residing in this country, are above the English average; and the lower orders exhibit a superiority in size to the English labourers."

* I have great pleasure in referring to his "Psychological Inquiries," published since this Paper was read, and which has reached a second edition, as a valuable contribution to psychological science.

Now, from what has already been observed, in reference to the structure of the human mouth, we can readily conceive how, under the influence of improved *outward circumstances*, by the mere adoption of the usages of civilized life, in relation to food alone, the elongated jaw, and the expanded zugoma, would, in the course of time, cease to be perpetuated; and such has actually proved to be the case. Every Negro has not the protuberant jaw, nor has every Turk the lozenge-shaped face. Under ameliorating circumstances, and social conditions favourable to the development of the moral feelings and intellectual faculties, these characteristic peculiarities have been softened down, and in some instances have entirely disappeared. The Ethiopian and Mongolian skull have acquired the elliptical or Caucasian type.

According to the concurrent testimony of medical observers, both in the United States and in the West Indies, where the influence of a *higher civilization* has been in powerful operation for a lengthened period of time, an approximation of the *Negro physiognomy* to the European model is progressively taking place, even where there has been no intermixture of European blood: nor is the alteration confined to the head and face. Dr. Hancock, indeed, of Guiana, asserts that it is frequently not at all difficult to distinguish a Negro of pure blood, belonging to the *Dutch* portion of the colony, from another belonging to the English settlement, by the correspondence between the features and expressions of each, and those which are characteristic of their respective masters. The testimony of Sir Charles Lyell, founded on personal observations, made during his recent tour in America, and on *indisputable* information, gleaned by him from others, leads to the same conclusion, that a gradual approximation is taking place in the configuration of the *head* and body of the Negroes to the European model, each succeeding generation exhibiting an improvement in these respects. Dr. Carpenter justly remarks—"It is not a little interesting to observe, that there are elements in the Negro character which have been deemed by competent observers capable of working a considerable improvement on even Anglo-Saxon civilization. Many intelligent thinkers have come to the conclusion, that the boasted

superiority of the latter is, after all, more *intellectual* than *moral*; and that in purity and disinterestedness of the affections, in childlike simplicity and gentleness of demeanour, in fact, in all the milder graces of the Christian temper, we may have much to learn from the *despised Negro*." 'I would expect,' says Dr. Channing, 'from the African race, if civilized, less energy, less courage, less intellectual originality, than in ours; but more amiableness, tranquillity, gentleness, and content. They might not rise to an equality in outward condition, but would probably be a much happier race.' The same observations have been made on the Negroes of the Guinea coast, and their descendants. It is not a little remarkable, that the earliest civilization of which we have any distinct traces in the western portion of the Old World—perhaps the very first development of the arts of life, and of a spiritual philosophy, which man has witnessed—should have presented itself in a race which was not only *African* in its locality, but also in its affinities, such being demonstrably the character of the *ancient Egyptians*. Yet to this race the civilization of Greece, of Rome, and of Western Europe, may be in a great measure ascribed; and long after the time when its power and intelligence had gained their highest state of development, the progenitors of the Anglo-Saxon race, both in this country and in Germany, were in a state of barbaric ignorance and brutality."*

Again, in the Mongolian race we find still more strikingly exemplified, changes in the typical character of the cranium, and of *deterioration* as well as of elevation, under the influence of outward circumstances and social states. Thus, on the one hand, we see in the brutalized and savage Bushman of the Cape the *prognathous* type and a degraded caste of the Mongolian Hottentot race. The process is well known of the conversion of Hottentots into Bushmen. The change of a mild, confiding, and unenterprising race of shepherds, into fierce, suspicious, and vindictive savages, who issue from the

* Dr. Carpenter on the *Varieties of Mankind*, in Dr. Todd's "Cyclopaedia of Anatomy and Physiology."

fastnesses of their rocky deserts only to plunder and destroy, has been witnessed even within the present generation, as the result of the encroachments of European colonization on the one side, and of the Kafirs on the other.

And again, on the other hand, in the case of the Turks of Europe and Western Asia, and of the Magyar race, we have striking illustrations of the change from the pyramidal to the elliptical type of the skull, under the ameliorating influences of civilization. The eastern Turks, retaining the nomadic habits of their ancestors, have retained also their pyramidal conformation, while in the Magyar race, of which the Hungarian nobility is composed, not inferior in physical or mental characters to any in Europe, we see a branch of the great northern Asiatic stock, closely allied in blood to the stupid and feeble Ostiaks and the untamable Laplanders. About ten centuries ago they were expelled, by Turkish invasion, from Great Hungary, the country they then inhabited, which bordered on the Uralian Mountains; and they, in their turn, expelled the Slavonian nations from the fertile parts of Hungary, which they have ever since occupied. Having thus changed their abode, from the most rigorous climate of the old continent—a wilderness where Ostiaks and Samoiedes pursue the chase during only the mildest season—for one in the south of Europe, amid fertile plains, abounding in rich harvests, they laid aside the rude and savage habits which they are recorded to have brought with them, and adopted a settled mode of life. In the course of a thousand years, their type of cranial conformation has been changed from the pyramidal to the elliptical, and they have become a handsome people, of fine stature and of regular European features. Nor is there any reason to regard this as the result of intermarriage with other races, for the Magyars are to this day distinct from the other inhabitants of Hungary.

And thus, in the Mongolian race, we see, on the one hand, the cranial deterioration and debasement carried to the uttermost limits of human degradation; and, on the other, its elevation raised, by symmetrical contour and lofty bearing, to the highest type of intellectual development. Nor is it a little remarkable, that the solitary, but beautiful skull, which the

venerable Blumenbach selected as the type of the highest order—the Caucasian race—if the views of Mr. Norris, and adopted by Dr. Latham, be confirmed,—was really and truly of *Mongolian origin*, and that the Georgian and Caucasian nations—the very people who have been selected as furnishing the type of the highest and most perfect conformation, by Blumenbach are but an *improved race* of a decidedly *inferior stock*.

Lastly, in the oval or Caucasian type, and among the Indo-European races, we find great diversities of cranial configuration; but on the present occasion I shall only briefly advert to the melancholy spectacle amongst ourselves of its degeneration into the prognathous and pyramidal type, under the influence of want, squalor, ignorance, and moral degradation. “There are certain districts in Leitrim, Sligo, and Mayo (as pointed out by an intelligent writer in the Dublin University Magazine, No. 48) chiefly inhabited by the descendants of the native Irish, driven by the British from Armagh and the South of Down, about two centuries ago. These people, whose ancestors were well-grown, able-bodied, and comely, are now reduced to the average stature of five feet two inches, are pot-bellied, bow-legged, and abortively featured; and are especially remarkable for *open, projecting mouths*, with prominent teeth and exposed gums, their advancing cheek bones and depressed noses bearing barbarism on their very front. In other words, within so short a period they seem to have acquired a prognathous type of skull, like the savages of Australia. In the hordes of wretched Irish, which famine drove to seek subsistence in the sea-ports and manufacturing towns of Great Britain, every gradation was perceptible, from the really noble type of countenance and figure seen in some of them, to that utterly debased aspect which can be only looked at with disgust. Again, it has been well observed, “A certain degree of regression to the pyramidal type may be noticed among the ‘*nomadic tribes*’ which are to be found in every civilized community. ‘Among these,’ says Mr. Henry Mayhew, an acute observer, ‘according as they partake more or less of the purely vagabond nature, doing nothing whatsoever for their living, but moving from place to place, preying on the earnings of the more industrious portion of the community,

so will the attributes of the *nomadic races* be found more or less marked in them; and they are all more or less distinguished by their *high cheek bones* and *protruding jaws*; thus shewing that kind of mixture of the pyramidal with the prognathous type, which is to be seen among the most degraded of the Malayo-Polynesian races.' ”

I cannot more appropriately close this communication, than by a quotation from my friend, Dr. Carpenter, and in acknowledging how much I am indebted for the subject-matter of the present paper to his elaborate and profound article on the Varieties of Mankind, in Dr. Todd's "Cyclopædia of Anatomy and Physiology." The question of psychical conformity or difference among the races of mankind, although one which has a most direct bearing upon their specific unity or diversity, has, besides, an importance of its own, even greater than that which it derives from this source. For, as has been recently argued with great justice and power, the real unity of mankind does not lie in the consanguinity of a common descent, but has its basis in the participation of every race in the same *moral* nature, and in the community of *moral* rights, which have become the privilege of all. "This is a bond which every man feels more and more, the farther he advances in his intellectual and moral culture, and which, in this development, is continually placed upon higher and higher grounds: so much so, that the physical relation arising from a common descent, is finally lost sight of in the consciousness of the higher moral obligations. It is in these obligations, that the *moral rights of men* have their foundation; and thus, while the Africans have the hearts and consciences of human beings, it would never be right to treat them as *domestic cattle* or *wild fowl*, if it were ever so abundantly demonstrated that their race was but an improved species of ape, and ours a degenerate kind of God."

"The *psychical comparison* of the races of man, in a practical point of view, is a most important investigation. And the evidence which has been accumulated on this subject raises no *impossible barrier* as to the unity of the species; the variations in the position and relative development in their respective psychical powers and tendencies not being greater, either in kind or degree, than those which present themselves

between individuals of our own or any other race, by some members of which a high intellectual and moral standard has been attained. The tests by which we recognise the claims of the outcast and degraded of our own, or of any other *high civilized* community to a common humanity, are the same as those by which we should estimate the true relation of the Negro, the Bushman, or Australian, to the cultivated European. If, on the one hand, we admit the influence of war, ignorance, and neglect in accounting for the debasement of the savages of our own great cities; and if we witness the same effects occurring, under the same conditions, among the Bushmen of Southern Africa, we can scarcely hesitate in admitting that the long-continued operation of the same agencies has had much to do with the psychical as well as the physical deterioration of the Negro, Australian, and other degraded savages; so on the other hand, if we cherish the hope that the former, far from being irreclaimable, may at least be brought up to the standard from which they have degenerated, by means adopted to develop their intellectual faculties, and to call forth the higher parts of their moral nature, no adequate reason can be assigned why the same method should not succeed with the latter, if employed with sufficient perseverance. It will be only when the effect of education, intellectual, moral, and religious, shall have been fairly tested by the experience of *many generations*, in conjunction with the influence of a perfect equality in civilization and social position, that we shall be entitled to speak of any essential and constant psychical difference between ourselves and the more degraded beings clothed in a human form. All the evidence which we at present possess leads to the belief, that, under a vast diversity in degree and in modes of manifestation, the same intellectual, moral, and religious *capabilities*, exist in all the races of mankind, leading us directly to recognise the community of a moral nature with ourselves, and our admission of them into a participation of our own rights."